

November, 1972

FROM THE PEN OF

YELLOW CANARY FEATHERS BY MIKE WOLVJ.



BEFORE I START OUT THIS MONTH I WOULD LIKE TO POINT SOME THING OUT. I WAS PROMISED MATERIAL TO PUT IN THIS MONTH'S ISSUE OF ZERO BEAT, AS YOU CAN SEE I'M LACKING SOME TO FILL THIS ISSUE. EVERY ONE WANTED LOCAL NEWS AND NOT STUFF THAT WOULD APPEAR IN QST EVENTUALLY. WELL, IF IT AIN'T HERE THEN IT WON'T GET PRINTED.

ENOUGH OF THIS BILLY DALLY..... FROM NOW ON THE DEADLINE FOR MATERIAL IS THE END OF THE 2nd WEEK OF EVERY MONTH.

THE OTHER DAY (SUNDAY THE 30th of Oct) (THE DAY AFTER I PICKED UP ED'S 20 AFTER HIS) I HAD TO SCRAP MY VERTICAL AND BUILD ANOTHER ANT. WELL, BEING NOW I'M HOME I DECIDED TO BUILD A DIPOLE FROM WHAT I HAD. A FRIEND OF OURS CAME OVER AND WANTED TO HELP FINISH IT. I STAY UP COURSE AND BROKE HIS HEAD AND GOT TO GO. (COULD YOU BELIEVE A 1.1 to 1 SWR) I PROCEEDED TO LEAVE THE KIT UP. LATE AFTER TURNING AROUND FOR A WHILE I FOUND SOMEONE CALLING CQ. I WENT BACK TO THE KIT AND STARTED A QSO. IN ABOUT 5 MINUTES THIS TURNED INTO A POPULAR PLACE FOR OPERATORS TO JAKE. NO ONE DECIDED TO QUIT AND LET IT GO AT THAT. THEN I FOUND A CLEAN PHONE AND STARTED CALLING CQ. I WAS ANSWERED IMMEDIATELY AND BEING A QSO. AGAIN THE SAME THING HAPPENED AND NO ONE WANTED TO QUIT. THE KIT WAS STILL I FOUND ANOTHER PERSON CALLING CQ. I WAS LUCKY AND MADE CONTACT THE FIRST CALL. AGAIN AFTER ABOUT 10 MINUTES A NEW QSO, BUT I DECIDED THAT LATER IF I COULD UP FROM THAT I COULD FIND A OTHER QSO. I HAD TWO PHONES AND WAS FORCED TO QUIT. AT THIS POINT MY FRIEND (WHO BY THE WAY IS A EX-CRER) ASKED ME HOW COME I SOUNDED LIKE OH. 20 AND EVERYBODY PALMED OVER EVERYONE ELSE LIKE ON CB. HE ALSO KNOWS THAT THE HAMS HAVE QUITE A FEW HANDS TO SPREAD ON. I COULD NOT THINK OF ANY REASON THAT WOULD EVER COME CLOSE TO EXPLAINING THIS. NOW I HAVE A LETTER FROM SOMEONE WHO I'VE BEEN OFF THE AIR FOR WHILE OVER A YEAR, BUT I STILL DID NOT HAVE AN ANSWER. I REMEMBER DON'T BELIEVE THERE IS ONE..... WHAT WOULD YOU CALL A NEW COMER IN A SITUATION LIKE THIS, AND BE TELLING THE TRUTH-ESPECIALLY A CRYSTAL?

Mike Wolv

#390 September 14.

FCC has now acted in the matter of Docket 19163, regarding the Extra Class license. Effective October 27, 1972, the rules will be amended to provide a waiting period of one year under license, rather than two, as a condition of eligibility to take the extra exam. Present holders of Advanced Class who at one time held the old Amateur Extra First ticket and have been continuously licensed since, will get credit for the 20 wpm code test for the extra exam. Such credit will also be granted holders of certain commercial operator licenses where the code requirement is comparable. Further details will appear in November QST.

A genius—is a screwball who makes a crackpot idea work.

MEMO TO ZERO BEAT

CONTRIBUTORS

Typed material would be appreciated.

This saves the editor time and

prevents errors. Your typed material

will be edited if space requirements

dictate. Please make your material

not more than three and one-half inches wide.

Schematics or drawings can also be reproduced by our printer. But, please, make them in ink or very dark pencil. Use a marking type pen if you like.

THYRISTORS

What is a thyristor? It is any semiconductor switch whose bistable action depends on p-n-p-n regenerative feedback. Thyristors can be two, three, or four terminal devices, and both unidirectional and bi-directional devices are available.

The most famous unidirectional thyristor is the SCR, silicon controlled rectifier. Others are SUS, silicon unilateral switch; LASCR, light activated silicon controlled rectifier; CSCR, complementary silicon controlled rectifier; GTO, gate turn-off switch; PUT, programmable unijunction transistor; and the SCS, silicon controlled switch. Shockley diode is a reverse blocking diode thyristor.

Pikes Peak Radio Amateur Association Inc.

Colorado Springs, Colorado

Member

Amateur Radio
News Service



Permission is granted to reprint articles or excerpts thereof provided full credit is given.

Copy deadline For ZERO BEAT is SECOND WEEK of each month

Ed Pompea, Business Manager
2111 Trent Ave. 80909
635-7554

CHARLES SMITH: DISTRIBUTION
2611 NORTH FARRAGUT AVE.
COLORADO SPRINGS, COLO. 80907
635-7353

The PPRAA meets the second Wednesday of each month
Security Savings East, East Platte at Union Blvd.

PRESIDENT'S COLUMN

We had scarcely finished our election at the October meeting when our newly elected President, Bill King submitted his resignation due to unforeseen developments. The PPRAA By-Laws provide that the Vice-President automatically becomes President. I will do my best in this capacity, and with the help of each and every member we can make PPRAA a better club than ever before.

At the November meeting we will hold an election to fill the one vacancy on the Board of Directors, then elect a new Vice-President from the five board members who are not already holding office.

During my tenure as President, I intend to make PPRAA responsive to the interests of its members in the FURTHERANCE OF AMATEUR RADIO. In this light, the theme I intend to pursue is participation by the club members, especially at the monthly meetings. If you're interested enough to come to the meetings, certainly you have something of interest to pass on to other members.

Along this same theme, there is no reason we can't fill ~~o~~ Beat each month with news of local AMATEUR RADIO activities. If you are proud of your particular AMATEUR RADIO activities, tell us why. If you tell others about it, you just may encourage them to try it too.

I anticipate that the monthly club meeting programs will be devoted to radio communications, in particular, AMATEUR RADIO. If you're looking for programs on other subjects, you're in the wrong club.

Hope to see you all at the meeting November 8th. Let's make PPRAA an AMATEUR RADIO club we can all be proud to be members of.

73, Wayne, W2TPV/0

CHRISTMAS PARTY

The December meeting is to be at Dott's. Don't show up at the usual meeting place, as the gang won't be there. Instead we will meet at Dott's Fine Food Restaurant, Saturday December 2nd at 1930 South Nevada, for a delicious dinner and entertainment. The cost will be \$2.00 for a fried chicken dinner or \$3.50 for a roast beef dinner. The festivities will start at 6:00 p.m. and the dinner at 7:00 p.m. Please confirm your reservations no later than November 15, by calling Chuck at 632-9343 or Wayne at 598-7096. Come on out for a great evening of entertainment and fun.

Chuck

at the November meeting we will be voting for one board member and a Vice-President. So, fellow! Your vote counts!

Dues for 1973 will soon be due. You can get an application at this month's meeting. Please print clearly or type. Send or give dues and the filled out application to your treasurer "Irv" Abel. Dues are: \$2.00 for associate membership and \$3.00 for full membership. Just add \$1 and the whole family is taken care of!

PPRAA DIRECTOR

PRESIDENT	
WAYNE BROWN	W2TPV/0
2829 SHADY DRIVE 80907	598-7096
VICE PRESIDENT	
SECRETARY	
IRVIN K. EBEL	W0KRV
1224 NORTH CUSTER 80903	473-3630
TREASURER	
EDITOR	
MICHAEL D. PAYNE	W0LWJ/A70XA
2312 WEST PIKES PEAK AVE. 80904	471-9362
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CHAIRMAN OF THE BOARD	
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1310 KINGSLEY DRIVE 80909	596-3633
EDWARD POMPEA	
2111 TRENT AVE. 80909	K0MFG
	635-7554
JULIAN D. CORTELL	
721 LAMING DRIVE 80909	W0ACT
	596-4216

Remember: when the club asks for money for the Repeater - JIV. Just a little from everyone will help lots. And for the people that use JIV a five or ten spot would really be appreciated.

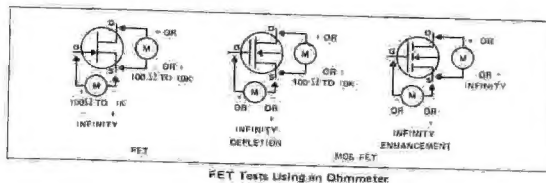
FLAME

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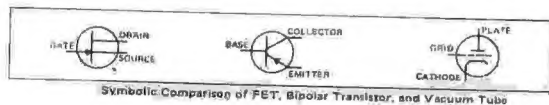
304 EAST DEL NORTE
COLORADO SPRINGS, COLORADO 80907
TELEPHONE (303) 632-4467

Circuit News



Characteristics Comparison of FET's, Transistor, and Vacuum Tube

Characteristic	J FET	MOS FET	Transistor	Tube
Impedance (input) (typical in ohms)	High (10 meg)	Very high (100 meg)	Medium to low (1000 Ω)	Very high (100 meg)
Average Life	Long	(Long, see text)	Long	Short
Gate/Base/Grid Current (typical, in amperes)	1×10^{-9}	1×10^{-12}	1×10^{-6}	1×10^{-9}
Noise (internal)	Low	Low (variable)	Medium to low	Low
Amplification Factor	Low	Low	Low to high	Low to high

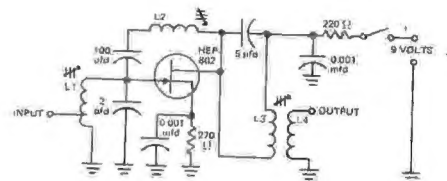


SAD NEWS

Mrs. Bernice Mintz, wife of Max Mintz, of D & M Electronics Supply, passed away November 2. She was active in the operation of the business for the past 20 years. Local amateurs always received a cheery smile from her. Services were held at Swan Funeral Home Nov. 3. We all extend our condolences to Max.

2-METER (150 MHz) PREAMPLIFIER

USES: Provides Low Noise Amplification Ahead of Receiver
FEATURES: 14dB Gain at Low Noise



PARTS LIST:

- 1 HEP 802
- 1 Ceramic Capacitor, 0.001 mfd 10V
- 1 Mica Capacitor, 2 pfd, 10V
- 1 Mica Capacitor, 5 pfd, 10V
- 1 Mica Capacitor, 100 pfd, 10V
- 1 Resistor, 220 Ω , 1/2 Watt, $\pm 10\%$
- 1 Resistor, 270 Ω , 1/2 Watt, $\pm 10\%$
- 1 SPST Switch
- 1 9 Volt Battery

(All coils wound on brassing ceramic form)
L1 5 1/4 turns, tapped at 1 1/4 turn, #26
L2 9 1/2 turns, #34
L3 5 turns, #26
L4 1 1/4 turn, #26, at low end of L3

NOTE: All leads should be kept as short as possible (pc board is recommended)

EMERY STUDIO

PORTRAITS — COMMERCIAL PICTURE FRAMING

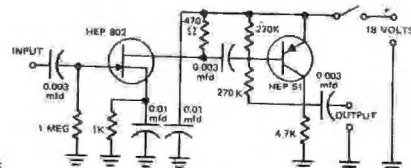
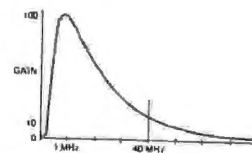
DON EMERY WQDYU

1 Block W. of Academy Blvd. between
Palmer Park Blvd. & Constitution Ave.

3730 E. La Salle Telephone 597-0026

BROADBAND RF AMPLIFIER

USES: Amplifies RF Signals Over the Range of 1 MHz to 40 MHz
FEATURES: High Input Impedance
High Signal-to-Noise Ratio



PARTS LIST:

- 1 HEP 802
- 1 HEP 51
- 1 Resistor, 1 meg, 1/2 Watt, $\pm 10\%$
- 1 Resistor, 1K, 1/2 Watt, $\pm 10\%$
- 1 Resistor, 4.7K, 1/2 Watt, $\pm 10\%$
- 1 Resistor, 470 Ω , 1/2 Watt, $\pm 10\%$

- 2 Resistors, 270K, 1/2 Watt, $\pm 10\%$
- 2 Ceramic Capacitors, 0.01 mfd, 25V
- 3 Ceramic Capacitors, 0.003 mfd, 25V
- 1 SPST Switch
- 2.9 Volt Batteries

DX

DX originally meant distant, or distance, for those early radio pioneers who wanted to work outside their immediate locale. As equipment improved, and more was learned about this strange hobby of ours, the meaning was gradually changed to mean outside the state, country, and eventually, outside the continent. Today the general interpretation of DX, as applied to the HF bands, means outside the country. Avid U.S. DXers generally mean outside the North American Continent.

There are approximately 325 countries as defined by the ARRL DX Committee. Although there are only some 156 independent countries in the world, ARRL applies many criteria to define and increase the country list so those of us who enjoy this phase of the hobby always have a "new" country looming in the future. Some of the criteria are; geographical separation by foreign land, separation by water and by government administration. Interestingly enough, ARRL refuses to recognize East Germany or Berlin as falling into any of these areas.

ing various totals and/or combinations of countries. ARRL awards the DXCC for 100 countries worked and confirmed. While DXCC was difficult to obtain at one time, today it is possible to work over 100 countries during a single weekend...hence the competition to push your total towards 325.

The International Short Wave League offers the Century Club Award and the Radio Club of Argentina applies a slight variation by requiring 101 confirmations to win the 101 Award.

Probably the most coveted DX award is the Worked All Zones, or WAZ, offered by CQ Magazine. Rather than rely on rather nebulous boundaries, they divided the world into 40 zones and confirmations from all 40 are required to win the WAZ. Your writer was fortunate in getting WAZ #1393 in 1960. Next month I hope to discuss some of the methods and procedures used to work not only the more common countries, but how to go after those elusive "rare" ones.

Since this is our first column, we are working with a limited input for who is working what from the Pike's Peak area. Please

advise me as to what you are working, and when, so it may be included in future columns.

Wayne, W2TPV/Ø has been working numerous JA stations on 21 mhz SSB. Russ, WBØGKF, worked F8RU and HB9AJI on 21cw, using a Ranger and a dipole only 10 inches above the roof. Since those are my only inputs, I must rely on my own log to demonstrate some of the DX that was being heard in this area during October.

14mhz 0200-0400Z
CR7BN, ZS1FF, ZS5KI, UK9KAD,
UL7CT, UAØSP, CE3CB and CP5BC.

21mhz 1400-1700Z
HA5KKB, OH2RL, YU2ACD, OK3DG, UK1
AAG, F8RU, DK6ML, I1PZ, EA2IA, ON4
AW, GI3YFY, SM3AT, LZ1KEZ and
PAØCWS.

21mhz 2300-0200Z
HM5EE, VK2EG, PY3CBX, VK6HD and
JAs all over the place.

28 MHZ
FGØAMC/FS7---1500Z, PZ5CW--1510,
CR6AD---1845 and ZL3AB---2200.

As you can see, more reports are needed from you DXers. Mail them to me at 1927 Wynkoop Drive, 80909 or phone them in at 596-1912 during the evening.

73, Dale, WØLDV

FOR SALE

HALLICRAFTERS SR-400 XGVR---400 WATTS
PEP, HA-20 CONSOLE FOR SPLIT OPERATION
EQ/W SWR BRIDGE, AC & DC PWR SUPPLIES
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MOBILE ANTENNA & COILS FOR 15-20-40
PACKAGE \$695. WILL CONSIDER SEPARATE
DALE, WØLDV, 596-1912

NOVEMBER 8 MEETING

Dale Green, WØLDV, will be our speaker on Nov. 8. He has promised an amusing and informative program entitled, "COMMUNICATIONS FOR LADY GODIVA".



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see dan - waØkxo

TOM'S MICROWAVE CORNER

CONDUCTED BY TOM SEGRAVES
UN6SAR

PROPAGATION AT MCRW FREQS

PART 3: COMMUNICATION LIMITATIONS

THE ATMOSPHERE AND/OR POOR PLANNING IN THE INSTALLATION OF MCRW SYSTEMS CAN SPELL THE DOOM OF ESTABLISHING COMMUNICATIONS. THIS IS ILTOPIC FOR THE COMPLETION OF PROPAGATION. I WILL POINT OUT SOME OF THE CONDITIONS THAT EFFECT MCRW IN THE ATMOSPHERE AND A FEW AREAS TO WATCH FOR IF YOU EVER DECIDE TO PLAY AROUND WITH MCRW. RADIO WAVES WILL TRAVEL, IN A VACUUM, ALMOST 186,000 MILES PER SECOND, OR IF YOU PREFER 330 YARDS PER MICROSECOND. I. ALMOST ANY OTHER MEDIUM, HOWEVER, WILL BE SLOWER THAN THAT OF A VACUUM. ALSO SIGNALS OF DIFFERENT FREQUENCIES HAVE DIFFERENT VELOCITIES BOTH IN AND OUT OF A VACUUM.

I WILL BE USING A UNIT CALLED INDEX OF REFRACTION. THIS IS A NUMBER, USUALLY A FRACTION, THAT IS DIVIDED INTO THE SPEED OF A RADIO WAVE IN A VACUUM. ALMOST 186,000 MILES PER SECOND, AND IT IS THE RESULT OF REFRACTION. AN INDEX OF REFRACTION IS USED TO FIND THE SPEED OF A RADIO WAVE IN ANY MEDIUM EXCEPT THAT OF A VACUUM SINCE IT'S 1.0. OK? HOPE IT'S CLEAR.

A MCRW SIGNALS IN AIR BECOMES SMALLER WITH DECREASING PRESSURE AND MOISTURE CORRELATE BUT LARGER WITH DECREASING TEMPERATURE. SO IN A NORMAL ATMOSPHERE, THE HIGHER IN ALTITUDE YOU GO THE SMALLER WILL BECOME EACH OF THE VARIABLES JUST NAMED. THE RESULT, UNDER NORMAL CONDITIONS, IS THAT MCRW SIGNALS DECREASES UNIFORMLY WITH HEIGHT UP TO APPROX. 20,000 TO 25,000 FEET. WITH THE INCREASE OF HEIGHT ANOTHER SITUATION EXISTS. THE PATHS FOLLOWED BY MCRW SIGNALS ARE ALMOST ALWAYS CURVED.

THE SPEED AT WHICH A MCRW SIGNAL TRAVELS THROUGH THE ATMOSPHERE DEPENDS ON THE THREE VARIABLES. USUALLY THE HIGHER THE TEMPERATURE THE FASTER THE SIGNAL. SAME WITH LOWERING THE WATER CONTENT AND THE ATMOSPHERIC PRESSURE. SO WHAT HAPPENS WITH AN INCREASE IN ALTITUDE? AN INCREASE IN THE SPEED OF THE SIGNAL.

NOT BECAUSE THE SPEED OF A SIGNAL INCREASES WITH AN INCREASE OF ALTITUDE THE SIGNAL WILL HAVE A TENDENCY TO CURVE IN A DOWNWARD DIRECTION. I'LL CALL THIS A DIPPLE CURVE. LET US TAKE A WAVE FRONT SO THAT THE PHASE OF THE SIGNAL IS THE SAME ACROSS THE WAVE FRONT. AS THE WAVE TRAVELS ALONG THE TOP WILL BE GOING FASTER THAN THE BOTTOM BECAUSE IT'S HIGHER IN ALTITUDE. THIS WILL CAUSE THE WAVE TO DIP DOWN JUST A LITTLE BIT AS IT TRAVELS ALONG.

RADIO WAVES ARE ALSO BENT WHEN THEY

PASS FROM ONE MEDIUM TO ANOTHER MEDIUM THAT HAS A DIFFERENT DENSITY. BECAUSE WAVES ARE BENT FROM LOWER DENSITY MEDIUM INTO A HIGHER ONE OUR ATMOSPHERE CAN CAUSE RADIO WAVES TO BE BENT AROUND THE EARTH. NOW A CURVED PATH LIKE THIS IS CALLED A DUCT. STRANGE AS IT MAY SEEM TO SOME OF YOU, THE GREATER WILL BE YOUR CHANCES OF GETTING INTO A DUCT WHICH WILL GIVE YOU ABNORMAL PROPAGATION EFFECTS.

THE THREE VARIABLES HAVE A HAND IN CAUSING THESE DUCTS THAT I HAVE MENTIONED. UNDER NORMAL CONDITIONS WHERE TEMP. AND MOISTURE DECREASE UNIFORMLY WITH ALTITUDE DUCTS CANNOT BE FORMED; HOWEVER WHEN A GREAT VARIATION OF MOISTURE AND TEMP. INVERSION EXIST TOGETHER THEN A DUCT IS LIKELY TO EXIST, TOO.

THERE ARE TWO OTHER PROBLEMS THAT THE ATMOSPHERE PRESENTS TO MCRW AND THEY ARE 1. SCATTERING THE MCRW SIGNALS OR 2. THE ABSORPTION OF THEM.

CONT. PAGE 6

EVERYTHING IN REAL ESTATE

HOMES LAND RANCHES SALES and RENTALS

ED POMPEA
635-7554

BILL KING
634-4751



596-8200
3803 PALMER PARK BLVD.
(NEAR THE RUSTIC HILLS SHOPPING CENTER)

[illegible][illegible]

第 1 章 绪论
 第 2 章 电路的基本概念和基本定律
 第 3 章 电阻电路的分析和计算
 第 4 章 动态电路分析和计算
 第 5 章 正弦稳态电路分析和计算
 第 6 章 非正弦周期电流电路分析和计算
 第 7 章 线性双口网络
 第 8 章 变压器和理想运算放大器
 第 9 章 互感和耦合电感
 第 10 章 受控源和线性双口网络
 第 11 章 三相电路
 第 12 章 功率因数校正
 第 13 章 交流电路的谐振
 第 14 章 交流电路的暂态分析
 第 15 章 交流电路的功率分析
 第 16 章 交流电路的功率因数校正
 第 17 章 交流电路的功率分析
 第 18 章 交流电路的功率分析
 第 19 章 交流电路的功率分析
 第 20 章 交流电路的功率分析

Two new editions of popular ARRL directories are now available for distribution. The current revision of the Repeater Directory, detailing 615 repeaters, requires an addressed envelope larger than 6 by 9 inches, with 24 cents postage for first class mailing. The 1972 Net Directory can be sent first class in an addressed legal size envelope with 16 cents return postage. For both directories, send the larger envelope with 32 cents postage. Directories have been mailed to those filing earlier requests.

AUTHORIZED GENERAL ELECTRIC DISTRIBUTOR



ROSIE'S REPORTINGS

Rosemarie Lewis

WA6MNL

COMMITTEES APPOINTED

NOMINATING COMMITTEE

Don Emery - W0DYM - Chairman

To choose 2 more members to assist him

2 - MASTER FM COMMITTEE

Clyde Still

Pete and Ida Demario - K0UDG - WA6PDA

Bob Sayers - W0OFA

David Givan - K0LAF

George Kowalski - W0GCK

Oak Stockton - K0ROL - also acting representative to CCARC

2 - RADIO AL COMMITTEE

"Doc" Cornell - W0JCT

Irv Abel - W0KIV

SEARCH AND RESCUE - El Paso County

George Kowalski - W0GCK

SCOUT ASSISTANT - EMERGENCY

Bob Sayers - Coordinator - W0OFA

RACES

Dean Jaynes - WA6PJH - Radio Officer

Ldon Lewis - assistant Radio Officer
WA6LDA

WALLS

Pete Demario - K0UDG

TECHNICAL INSTRUCTION COMMITTEE

John Summers Sr. - WA6JSH
Charles Myers - WA6ZCS
Elmer Schladweiler - WA6WY
Will Gordon - W0GUF

HISTORIANS

Jim Reynolds - W0JME

"Doc" Cornell - W0JCT

Gene Bacon - W0CKY

AUCTION COMMITTEE

Pete Demario - K0UDG

Bill Haskins - K0CEN

Oak Stockton - K0ROL

Ida Demario - WA6PDA

AUDITING COMMITTEE

Bill Haskins - K0CEN

Art Mayer - WA6ASH

INTERFERENCE COMMITTEE

James Don Carlos - W0ITU - chairman

To chose 2 members to assist

XL COMMITTEE

Alex Allison - W0ROY/0

Ida Demario - WA6PDA

Linda Vidmar - W0LBI

SCOOP COMMITTEE (SUPPORTING LEVEL OF OPERATORS)

Iris Summers

Ida Demario

Alene Green

Liz Don Carlos

Shirley Kowalski

COOPERATION COMMITTEE

"Marty" Brown - W0VTH/0

Ida Demario - WA6PDA

Irene Pompea - W0JHI

Woss Abel

James Don Carlos - W0ITU

Dean Jaynes - WA6PJH

Dale Green - W0LDV

Irv Abel - W0KIV

Maury Wunderlich - WA6YNP

Harlan Park - WA6TVS

Chuck Lucas Jr. - WA6LUN

Fred Palmblad - W0CYM

WIS

Jayne Brown - W0ZPV/0

Mike Stansbury - W0BCK

CONTEST COMMITTEE

Dale Green - W0LDV

Jayne Brown - W0ZPV/0

0-100

Mike Jayne - W0LTH/0

Ed Pompea - W0JPI

Ganda Jayne - Typist

CCARC

Charles Myers - WA6ZCS

Oak Stockton - K0ROL

FIELD DAY

"Doc" Cornell - W0JCT

ARRL VICE DIRECTOR FOR PEARL

"Irv" Abel - W0KIV



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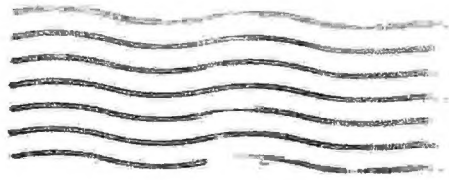
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 RCA HOME STEREO SPEAKERS, \$24.95 pair
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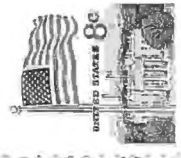
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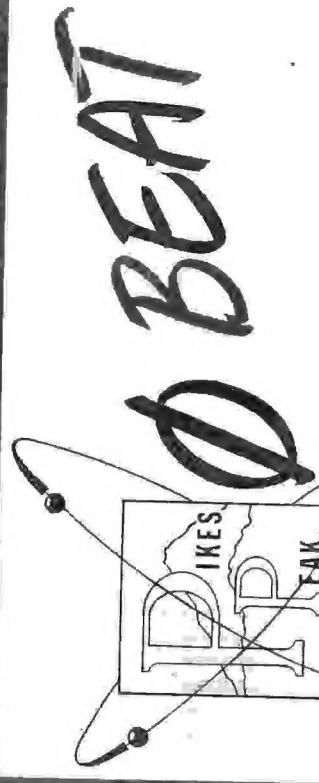
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NOVEMBER 1972

